

WHAT IS CLAIMED IS:

1. A heat conductive polishing pad for chemical-mechanical
polishing comprising:

a polishing body including a thermoconductive polymer having
a substrate with filler particles contained therein wherein said
filler particles contain a Group II salt.

2. The heat conductive polishing pad as recited in Claim 1
wherein said polishing body further includes a base pad and said
thermoconductive polymer forms a polishing surface located over
said base pad and said thermoconductive polymer has a thermal
conductivity of greater than about 1 Watts $m^{-1} K^{-1}$ and an electrical
volume resistivity of greater than about 1×10^{15} ohm cm^{-1} at 25°C.

3. The heat conductive polishing pad as recited in Claim 1
wherein said substrate is selected from the group consisting of:
polyurethane;
polyolefin; and
polyvinyl esters.

4. The heat conductive polishing pad as recited in Claim 1
wherein said substrate is selected from the group consisting of:
polyurea;

4 polycarbonate;
5 aliphatic polyketone;
6 polysulfone;
7 aromatic polyketone;
8 6,6 nylon;
9 6,12 nylon; and
10 polyamide.

5. The heat conductive polishing pad as recited in Claim 1
2 wherein said substrate is selected from the group consisting of:
3 thermoplastic rubber; and
4 melt-processible rubber.

6. The heat conductive polishing pad as recited in Claim 1
2 wherein said substrate is selected from the group consisting of:
3 polypropylene;
4 polyethylene;
5 crosslinked polyethylene;
6 ethylene vinyl acetate; and
7 polyvinylacetate.

7. The heat conductive polishing pad as recited in Claim 1
2 wherein said thermoconductive polymer has a grafted compound
3 located substantially throughout said polymer.

8. The heat conductive polishing pad as recited in Claim 1
wherein said thermoconductive polymer has a modified surface and a
grafted surface on said modified surface, said grafted surface
comprising a grafted compound.

9. The heat conductive polishing pad as recited in Claim 7
wherein said grafted compound includes an inorganic metal oxide.

10. The heat conductive polishing pad as recited in Claim 8
wherein said grafted compound includes an inorganic metal oxide.

11. The heat conductive polishing pad as recited in Claim 7
wherein said thermoconductive polymer has a foam structure and said
grafted compound includes a controlled watability compound.

12. The heat conductive polishing pad as recited in Claim 8
wherein said thermoconductive polymer has a foam structure and said
grafted compound includes a controlled watability compound.

13. The heat conductive polishing pad as recited in Claim 7
wherein said grafted compound includes an organic compound.

14. The heat conductive polishing pad as recited in Claim 8
wherein said grafted compound includes an organic compound.

15. The heat conductive polishing pad as recited in Claim 1
wherein said Group II salt includes an anion selected from the
group consisting of:

Sulfate;
Stearate; and
Carbonate.

16. The heat conductive polishing pad as recited in Claim 1
wherein said Group II salt includes an anion comprised of oxide.

17. The heat conductive polishing pad as recited in Claim 1
wherein said Group II salt is Magnesium Oxide.

18. The heat conductive polishing pad as recited in Claim 1
wherein said Group II salt includes an anion comprised of
hydroxide.

19. The heat conductive polishing pad as recited in Claim 1
wherein said filler particles comprise at least about 20% by weight
of said thermoconductive polymer.

20. The heat conductive polishing pad as recited in Claim 1
wherein said filler particles have a spherical shape having an
average diameter of less than about 50 μm to about 1 μm .

21. The heat conductive polishing pad as recited in Claim 1
2 wherein said filler particles are incorporated substantially
3 throughout said substrate.

22. A method for preparing a heat conductive polishing pad
for chemical-mechanical polishing comprising:

providing a substrate;

blending filler particles containing a Group II salt into said
substrate to thereby produce a thermoconductive polymer; and

forming a polishing body from said thermoconductive polymer
suitable for polishing a semiconductor wafer or integrated circuit.

23. The method as recited in Claim 22 further including
extruding said thermoconductive polymer from an extrusion apparatus
to provide a thermoconductive foam for forming said polishing body.

24. The method as recited in Claim 22 wherein forming said
polishing body further comprises coupling a base pad under said
thermoconductive polymer and said thermoconductive polymer has a
thermal conductivity of greater than about 1 Watts $m^{-1} K^{-1}$ and an
electrical volume resistivity of greater than about 1×10^{15} ohm cm^{-1}
at 25°C.

25. The method as recited in Claim 22 further comprising
exposing said polishing body to an initial plasma reactant to
produce a modified surface thereon; and

exposing said modified surface to a secondary plasma reactant
to create a grafted surface on said modified surface.

26. The method as recited in Claim 22 further comprising
2 exposing said polishing body to a precursor dissolved in a
3 supercritical fluid to thereby produce a modified polishing body.

27. The method as recited in Claim 22 wherein said blending
2 further comprises exposing said substrate to said filler particle
3 dissolved in a supercritical fluid to thereby produce said
4 thermoconductive polymer.

28. The method as recited in Claim 27 wherein said
2 supercritical fluid includes an initiator that includes sufficient
3 water such that said Group II salt includes an anion substantially
4 comprised of hydroxide.

29. A polishing apparatus comprising:

a mechanically driven carrier head;

a polishing platen, said carrier head being positionable against said polishing platen to impart a polishing force against said polishing platen; and

a polishing pad attached to said polishing platen and including a polishing body comprising a thermoconductive polymer having a substrate with filler particles contained therein wherein said filler particles contain a Group II salt.

30. The polishing apparatus as recited in Claim 29 wherein said Group II salt includes an anion comprised of hydroxide capable of decomposing to oxide and water during chemical-mechanical polishing.